

Customer No.: 31561
Application No.: 10/065,874
Docket No.: 9788-US-PA

IN THE CLAIMS

Please amend the claims as follows, and the following listing of claims substitute all prior versions and listings of claims in the application.

1. (currently amended) A method for fabricating a polysilicon layer, comprising:
providing a substrate;
forming a barrier layer on the substrate;
forming a porous material layer on the barrier layer, wherein the porous material layer comprises an alloy of silicon oxide and aluminum oxide, and the barrier layer and the porous material layer form a buffer layer;
forming an amorphous silicon layer on the porous material layer; and
performing a laser annealing process to form a polysilicon layer via recrystallization from the amorphous silicon layer,
~~wherein, through direct contact of the porous material layer with the amorphous silicon layer, the polysilicon layer is formed with greater grain size due to lower thermal conductivity of the porous material layer.~~
2. (original) The method of claim 1, wherein the barrier layer is formed by chemical vapor deposition.
3. (original) The method of claim 1, wherein the barrier layer comprises silicon nitride.
4. (original) The method of claim 1, wherein the porous material is formed by e-beam evaporation.

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5. (original) The method of claim 1, wherein the porous material layer comprises silicon oxide.

Claim 6 (canceled).

7. (previously presented) The method of claim 1, wherein a ratio of the silicon oxide to the aluminum oxide in the silicon oxide/aluminum oxide alloy is about 95:5.

8. (original) The method of claim 1, wherein the thermal conductivity of the porous material layer is lower than 0.014W/cm-K (20 degrees Celsius).

9. (original) The fabrication method of claim 1, wherein the laser annealing process includes an excimer laser annealing process.

10. (currently amended) A fabrication method of a polysilicon layer, comprising:

providing a substrate;

forming a barrier layer on the substrate;

forming a stress buffer layer on the barrier layer;

forming a porous material layer on the stress buffer layer, wherein the porous material layer comprises an alloy of silicon oxide and aluminum oxide, a thermal conductivity constant of the porous material layer is lower than that of the stress buffer layer, and wherein the barrier layer, the stress buffer layer and the porous material layer form a buffer layer;

forming an amorphous silicon layer on the porous material layer; and

performing a laser annealing to form a polysilicon layer ~~via recrystallization from the amorphous silicon layer,~~

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~~wherein, through direct contact of the porous material layer with the amorphous silicon layer, the polysilicon layer is formed with greater grain size due to lower thermal conductivity of the porous material layer.~~

11. (original) The method of claim 10, wherein the barrier layer is formed by chemical vapor deposition.

12. (original) The method of claim 10, wherein the barrier layer comprises silicon nitride.

13. (original) The method of claim 10, wherein the stress buffer layer is formed by chemical vapor deposition.

14. (original) The method of claim 10, wherein the stress buffer layer comprises silicon oxide.

15. (original) The method of claim 10, wherein the porous material is formed by e-beam evaporation.

16. (original) The method of claim 10, wherein the porous material layer comprises silicon oxide.

Claim 17 (canceled).

18. (previously presented) The method of claim 10, wherein a ratio of the silicon oxide to the aluminum oxide in the silicon oxide/aluminum oxide alloy is about 95:5.

19. (original) The method of claim 10, wherein the thermal conductivity of the porous material layer is lower than 0.014W/cm-K (20 degrees Celsius).

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20. (original) The method of claim 10, wherein the laser annealing process includes an excimer laser annealing process.

21. (previously presented) The method of claim 1, wherein the barrier layer is about 500 angstroms thick, and the porous material layer is about 500 angstroms to about 2000 angstroms thick.

22. (previously presented) The method of claim 10, wherein the barrier layer is about 500 angstroms thick, the stress buffer layer is about 1500 angstroms thick, and the porous material layer is about 500 angstroms to about 2000 angstroms thick.

23. (new) A method for fabricating a polysilicon layer, comprising:

providing a substrate;

forming a barrier layer on the substrate;

forming a porous material layer on the barrier layer, wherein the porous material layer comprises an alloy of silicon oxide and aluminum oxide, and the barrier layer and the porous material layer form a buffer layer, wherein a ratio of the silicon oxide to the aluminum oxide in the silicon oxide/aluminum oxide alloy is about 95:5;

forming an amorphous silicon layer on the porous material layer; and

performing a laser annealing process to form a polysilicon layer.